

NORTHROP EXHIBIT H

①

Key features:

BSAC

PCR or thermal-cycle driven
 enzymatic reactions, but
 includes other DNA (or
 other biochem or chem) reactions

All techns. involving reaction-based
 methodologies

Ability to integ elec, mech
 or optical comp's. using micro-fab
 techs:

Reaction parameter control: heating,
 pumping, circulating, cooling

Reaction or reagent detection-manipulation

With Appl. divided Fig. 2 chamber +
 specific sys. for carrying-out
 PCR reactions. What are
minimum comp's. of such a system?

Detect:
 mass change,
 density,
 viscosity

Bio chem reaction manip,
 control + detection. Chamber-wave
 devices - to pp, mix & detect;
 (2) electrokinetic effects to pp,
 sys or pressure; (3) interg-T
 control devices; (4) optical filter;
 (5) chamber w/ heating elements

ATT

Allen Northrup

Dick White

1/11/92

→ thermal cycling

claim: mixing chamber; also
clean system.

Micro liter vols → used in system
smaller - can be done faster
w/ less power.

96°C → 55°C → heat & cool.
system on

Re-packaged/chips → novel:
integ. on chips.
chem. or bio-chem

* PCR or any other reaction that
requires thermal cycling.

Monolithic, microFab device →
1st time such a sys
has been done on this scale.

(microscopy) (3)

use of hand-wheel as \rightarrow
moves particles in single

* file
* chk to see if I have
file on white's us
5,006, 149.

unifex: microheaters in chamber
key part of inv. / system.

Fiber optic inside reaction chamber
for detection.

PCR techs now take about ^{1 to 5 min. now} ~~1 to 2 hr~~
~~of inv. can get results in~~
~~1 to 5 minutes.~~ Fastest is
now in time. ~ can get
results in a few seconds.
re cycles on the order of
a cycle. Due to small
vols + high surface area.
could be portable + work in
batteries. as opposed to 110V.

~~to diff. surfaces~~

* Reactions dep. on concentration

(4)

on \rightarrow 3 volts in 96°C based on heater Res.
 off \rightarrow 1/2 volts in 55°C " "

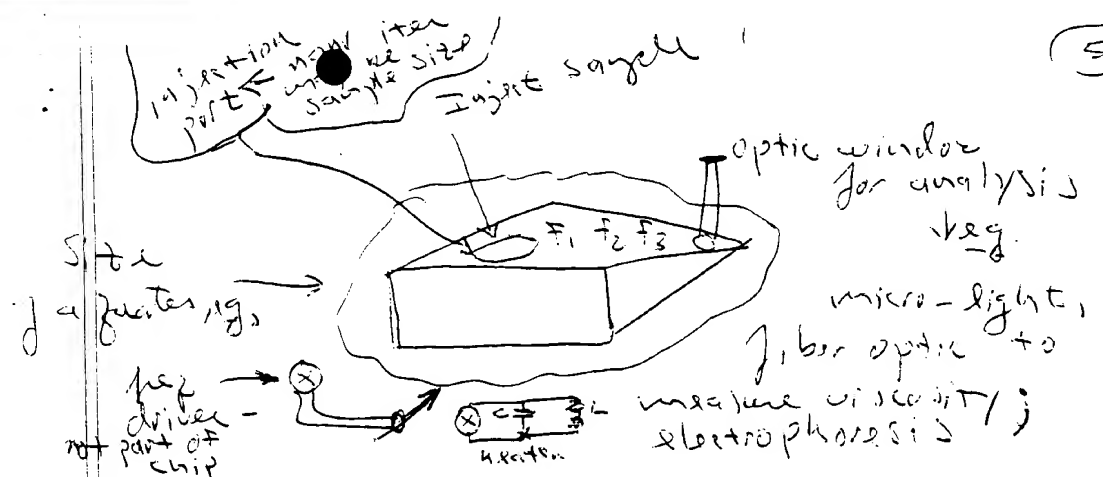
Monolithic Forb - is very important
 - can do in batches on
 wafers. Thus they are
 cheap & are disposable.

* Need spec. sheet for chamber
 fabrication

PPLing in chamber - re Dick
 white

chamber - includes ultrasonic
 agitator for mixing.

\downarrow Also useful for cell dispensing



pump, mixer etc run
a diff pres (F_1, F_2, F_3) so
can turn diff cover on top
key opening a diff pres.
Heating is also done by turning F_4
in heater.
Key doing PCR on chip w/
reaction chamber.

~~Materials~~ materials used in chamber
can negatively affect PCR
reaction eg. Calcium
divalent cations will prevent
PCR from working.

Reactants on chip in advance
of sold as a unit.

Use of surface tension to maintain reactant

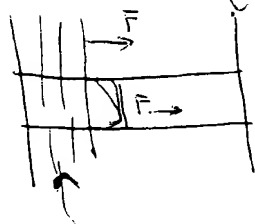
Possible talks / pubs: none on
the horizon; Oct 1992

Draft appl to Investors by July
to mid-June & file by end
of June

* Remote drive

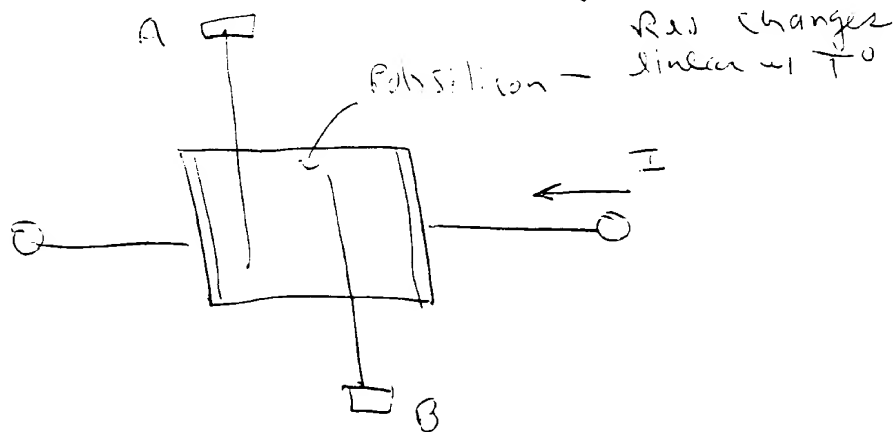
Adcs: All parts of channels moved at
same speed - adv. of inst-
wave PP.

dec white's
US 5,006,749



Lamb-type
generators

T^0 control \rightarrow Nice feature.



Use ~~leads~~ ^{electrodes} A & B to measure T^0 change. Send in known current I & measure voltage bet. electrodes A & B.

This detail should be in log.

SiO_2 - is material at bottom
of chamber; std material
handled by bio-chemists

DNA probes - in chamber;
parts attach to probes + sensor
5 3 detect, mass
change so know have attachment
to probes.